

Invasive Species and the Conservation Community

Wildland Weeds

FALL 2000



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Visit these websites:

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Wildland Weeds is published to provide a focus for the issues and concerns regarding exotic pest plant biology, distribution and control. To become a member of the Florida EPPC and receive the Council newsletter and *Wildland Weeds* Magazine, contact the Treasurer.

About the cover:
Few conservation groups have pressed for the control of chinese tallow (*Sapium sebiferum*), even though this species is overrunning habitat vital to endangered species icons such as the whooping crane (*Grus americana*). Photo by Patick Lynch, South Florida Water management district.

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Weed control has evolved from the use of sharp sticks by early hunter gatherers, through the use of hoes, animal powered cultivators, mechanical devices, and chemicals such as sea salt, to the use of highly sophisticated synthetic herbicides. In 1951, the study of weeds emerged as a science of its own with the publication *Weeds* by the Association of Regional Weed Control Conferences (ARWCC). Subsequently, the advancement of weed science and education has been greatly aided by establishment of the Weed Science Society of America in 1956, who renamed the journal to *Weed Science* and began publishing the applied journal *Weed Technology*. The need to regulate certain plant species because they are or have the potential to be harmful weeds was manifested in passage of the Federal Noxious Weed Act of 1974. These efforts have been, for the most part, focused on economically important weeds in agriculture or transportation. Only recently has the importance of natural area

weeds emerged as a focus of weed science.

When the idea of the Florida Exotic Pest Plant Council was born during 1982 and '84, "Exotic Woody Plant Workshops" in south Florida and the FLEPPC was established in 1984, the vehicle was created to focus on the urgent need for research and education pertaining to natural area weeds. Taking the FLEPPC lead, there are now Exotic Pest Plant Councils, state and regional, organized and being organized throughout the country. Now, efforts by those who recognized, early on, the threat of natural area weeds has culminated in greater recognition and interest in the threat of exotic invasive plant species, as natural area weeds, than ever before. With the Federal Invasive Species Advisory Council initiatives, and growing international concerns over invasive species, we'll need to work harder than ever. I challenge each and every *Wildland Weeds* reader to roll up their sleeves and take advantage of the current opportunities to protect our natural areas from invasive exotic plant species. As the newly elected Chair of FLEPPC, I look forward to working with you - see you in Athens in March, 2001. - Ken Langeland

The **story** behind the IFAS assessment of **NON-NATIVE PLANTS** in Florida's natural areas.

Alison M. Fox, Doria R. Gordon, Joan A. Dusky,
Linda L. Tyson and Randall K. Stocker.
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Introduction

There is a growing awareness of the problems related to non-native invasive species: for example, the Wilcove et al. (1998) report which indicated that invasive species are second only to habitat loss as the leading threat to imperiled species the U.S., and the February 1999 Executive Order on Invasive Species. This attention emphasizes the importance of acknowledging that only a small percentage of introduced species create a problem in natural areas (Lippincott 1996), and that quantifiable ecological and economic effects caused by invasive plants range from negligible to catastrophic.

There are at least two categories of invasive plants that must be addressed, those currently in our wildland habitats, and those that have not yet arrived. Ideally we could predict "invasion potential" of new species and prevent the introduction of new problems, or at least identify and eradicate them as soon as they are detected. Around the world there is a concerted effort to develop such predictive models (e.g., Australian Weed Risk Assessment [\[www.aqis.gov.au/docs/plpolicy/wrmanu.htm\]\(http://www.aqis.gov.au/docs/plpolicy/wrmanu.htm\)\), and many of them appear to be efficient at identifying potential problem species, especially based on information such as whether a species has been a problem elsewhere. A concern about many of these models has been that they are often overly restrictive, in some cases falsely accusing up to 20% of plants that have never \(at least in the studied timescales\) been found to be invasive \(Reichard and Hamilton 1997\). Managers of natural areas may not consider this to be much of a flaw, but this is unacceptable to the many people who believe that supplies of plants for food, fiber, and landscaping should not be unnecessarily restricted.](http://</p></div><div data-bbox=)

It should be easier to identify, describe and assess invasive plants after they have escaped from cultivation and are appearing in natural areas. However, non-native plants are spread across a continuum of invasiveness that often changes with time. Also, invasiveness is a relatively subjective term, so different people have varying perspectives of what constitutes minor versus significant impacts. It is not hard to recognize the extremes. The invasive "no-brainers" are typically well-established and little-disputed species, many of which are already subject to state and/or federal regulation (i.e., melaleuca - *Melaleuca quinquenervia*, kudzu - *Pueraria montana*, cheatgrass - *Bromus tectorum*, etc.). On the other hand, we recognize that there are many exotic crops, for example, that do not survive without human intervention in the form of fertilizers, irrigation, etc. Contro-

versy, however, haunts the middle ground and usually surrounds those commercially important species that are either just starting to escape or that appear in natural areas but with unknown or poorly documented impacts.

Is Another Assessment Needed?

Since 1984, the Florida Exotic Pest Plant Council (FLEPPC) has lead the way in classifying certain plants as "species that are invading and disrupting native plant communities in Florida" based "...on the documented ecological damage caused" - Category I, or as "species that have shown a potential to disrupt native plant communities" - Category II. These lists are revised biennially by a committee of 12 experts within FLEPPC. The lists serve a variety of purposes (see "Florida's most invasive plant list" at <http://www.fleppc.org/>) with the precautionary objective to alert managers of natural areas to currently, or potentially, problematic species. Many natural areas within Florida are managed with a policy to remove and ex-

clude all exotic plants. The FLEPPC lists assist managers in prioritizing invasive species for management, since few resource budgets allow removal of all exotic plants.

Things become more controversial when these lists are adopted for other purposes, such as the development of local ordinances banning the use of certain non-native plants. With a large gap between the FLEPPC lists and the state and federal regulations (on the 1999 lists only 25 out of 65 Category I and 3 out of 60 Category II species are government regulated), it is not surprising that proactive local organizations have embraced the Category I list. Such regulations have alarmed ornamental horticulturalists and landscape designers, who question why some commercially important species such as coral ardisia (*Ardisia crenata*), heavenly bamboo (*Nandina domestica*), and lantana (*Lantana camara*) are on the Category I list. Their concerns are magnified because, while distribution maps are available on the FLEPPC website, systematic, written criteria and documentary evidence on which the FLEPPC lists are based are not available.

Conflicting opinions with regard to certain species have been mirrored within the University of Florida's (UF) Institute of Food and Agricultural Sciences (IFAS) where some faculty may be recommending certain non-native species for landscaping, while others are supporting the FLEPPC lists and are developing control programs for the same species. In an effort to resolve these internal conflicts, a sub-committee of the IFAS Invasive Plants Working Group was established in early 1999 to develop an assessment of non-native plants in Florida's natural areas.

Purpose and objectives of the assessment.

The primary purpose of this assessment is to provide a mechanism to be used within UF to develop consistent descriptions of, and recommendations for, the use and management of non-native plants in Florida. Secondary objectives are to provide a level of information that is intermediate between simple presence or absence on a list and all the data that are available on

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any given species (such as in the FLEPPC / Department of Environmental Protection [DEP] database and reviewed by Langeland and Craddock Burks, 1998); and to identify the frequent data-gaps in our knowledge of these species which would assist in setting research priorities. We also hope that the assessment provides a tool that will help resolve some of the conflicts identified by the liaison committee between FLEPPC and the Florida Nurserymen and Growers Association (FNGA).

The requirements for this assessment were clear: it should have transparent criteria that are defensible by all UF/IFAS faculty, and all evidence and decisions should be documented and archived for anyone to review. Far less is published about most invasive species than desired for an assessment, and anecdotal information can be difficult to defend without further substantiation. Thus, we have defined documentary evidence as being either published and quantitative or as written observations from three biologists, any of whom could be contacted for confirmation. It is also important to recognize that this assessment does not substitute for the FLEPPC lists, though we hope that some of the data will be useful for the FLEPPC list committee. Neither would this process be a sufficient replacement for formal (and much more costly and complex) risk-benefit analysis, such as is performed in the development of State regulations prohibiting the use of a species.

After reviewing similar assessments that have been developed elsewhere (e.g., Hiebert and Stubbendieck 1993) an early and important decision was to limit this assessment, wherever possible, to non-predictive information about existing plant populations in Florida. Predictive evaluations are certainly needed for this State, particularly focusing on species not yet introduced to Florida, but the speculation inherent in prediction would jeopardize the credibility of the whole assessment. Additional lessons learned from other assessments were to: provide quick exits from the evaluation for non-invasive species; use multiple questions with simple choices (usually yes or no) but with mechanisms to acknowledge

some uncertainty; and uncouple the level of impacts of a species from its current extent of invasion (so an early invader is not automatically rated as of less concern than a widespread established species). We also decided to divide Florida into three zones (roughly corresponding to USDA growing zones) for which species would be assessed separately, a geographic distinction that was coincidentally incorporated into the 1999 FLEPPC lists. Typically this assessment will be used at the species level, but where there are cultivars that differ in characteristics relevant to this assessment (e.g., sterile cultivars), they should be assessed separately.

“Invasiveness is very broadly defined as the establishment of self-sustaining plant populations that are expanding within a natural plant community with which they had not previously been associated...”

General overview of the assessment.

The complete IFAS assessment is available to view and download from the UF/IFAS Agronomy Department website (<http://agronomy.ifas.ufl.edu/IFASassessmt.pdf>) and we encourage people to provide suggestions for improvement of this document. The assessment has five major sections, one to define if a species is invasive in Florida, and one for each of four indices - Ecological impacts; Potential for expansion; Difficulty of management; and Commercial value, closing with the Conclusions. This assessment is intentionally broader than just determining whether a species is invasive (e.g., the latter two indices provide important information that does not address that issue), and there is no intention to offset commercial value against ecological impacts.

Invasiveness is very broadly defined as the establishment of self-sustaining plant populations that are expanding within a natural plant community with which they had not previously been associated (Vitousek et al. 1995). Within each zone of the State (north, central, and south) invasiveness must be documented in natural areas where there has not been significant human disturbance, or the plant must have survived restoration of the natural communities. A species that does not thus qualify as invasive exits from this assessment, unless it is known to hybridize with threatened or endangered, or commercially-important species.

Continuing to assess a species separately for each zone, the ecological impacts are evaluated based on the worst known site(s), without or before any control effort. Scores are assigned to six items in this section that address disruption of ecosystem processes, impacts on threatened or endangered species, competitive displacement, changes in community structure and hybridization with native species. This impact score is increased if the species can invade a broad range of habitats. If the worst impacts are found in only a small proportion of all invaded sites *and* if such sites can be defined and avoided, then limited uses of the plant may be specified to reduce the likelihood of such impacts occurring, but this is unlikely to apply to many species. It is important to remember that IFAS Extension programs provide information for our clientele, the end-users; local, state, and federal agencies make decisions about what species can be planted, and where. That an invasive plant may not cause problems in one particular part of Florida is the type of information that we at a University can provide. Whether or not the planting of that species should be permitted is not within our purview.

In zones that a plant has invaded, an assessment of high or low potential for further expansion (one of very few “predictive” questions) is based on the number of new sites reported to be infested in the last five years (using reports from the FLEPPC / DEP database and other surveys). For zones where a species has not yet invaded, the potential for expansion is based on

the likelihood that it could survive and cause impacts in the climates and habitats of that zone.

Difficulty of management and commercial value are assessed on a state-wide basis and result in scores based on 10 and 4 items, respectively. A species is considered more difficult to manage if non-target damage is hard to avoid, if access and methods of control are costly, if there are large or dispersed areas to be managed, or if the likelihood of regrowth and re-colonization is high. Commercial value turned out to be the most challenging index because there is no tracking of state-wide sales receipts by species. Nobody, including representatives from FNGA, was very happy with the rather vague items in this section related to retail sales and importance to nursery growers or farmers. Thus, an analysis of the economic impact of potentially invasive plants in the ornamental nursery industry has been proposed as an important area for future research.

Assessment conclusions.

Authors of IFAS Extension publications that discuss any of the species that have been assessed with this instrument will use the language designated in the Conclusions section. For all indices other than ecological impacts, the scores for a species are assigned to a high or low category. Scores for ecological impacts, the index which drives the development of conclusions, are assigned to low, medium, high, or very high categories. Based on the permutations of these high, low, etc. categories for each index, one of the following conclusions is designated by zone for a species:

Not considered a problem invasive at this time (low impacts and potential for expansion)

Caution, prevent escape of this plant (low impacts but high potential for expansion)

Avoid use of this plant (medium to high impacts)

Do not use this plant (high to very high impacts)

While this language has no regulatory authority and is obviously superseded by any state or federal prohibitions, it is intended to provide consistent guidance to IFAS Extension per-

sonnel in making recommendations for use of these plants. All species will be reassessed as new information becomes available (especially in relation to new sites or impacts) and at least every 10 years. Plants with "Caution" or "Avoid" conclusions are to be reassessed every two years. Additionally, some of the plants assigned to "Avoid" will be recommended for a formal risk-benefit analysis. Typically these plants will have medium to high ecological impacts and high commercial value, and the risk-benefit analysis should be conducted promptly. Species that are rated with very high impacts, that score highly on all indices, or that have a combination of medium to high impacts, high potential and low value, will not be recommended for use.

For a few species with medium impacts and an "Avoid" conclusion, a caveat is added that *if* specific conditions for use could be defined from which escape and invasion could be prevented, then specific and limited use recommendations could be made. Currently such circumstances seem unlikely but with educational programs, conspicuous plant labeling, and enforcement of penalties for mis-use, it is conceivable that some plants could, for example, be approved for use only as indoor foliage.

Where are we now?

The assessment has been scrutinized within IFAS and by a number of external reviewers, resulting in approval for use by the IFAS Invasive Plants Working Group. We would like to have additional input on the assessment itself, and in due course, on the data that are collected for each species.

In developing the assessment, over 20 species were tested without the formal collection of documentary evidence. This range of species represented all categories for each index and all conclusions, and it was interesting to note that there were regional differences for most species. In their formal assessment, it takes a substantial effort to collect and document the appropriate data for each species and we have several part-time staff dedicated to this task (funded by IFAS and FNGA). As results are compiled, they will be made available online. As a large number of

species are assessed, we will test the structure and questions in the assessment to see if there are redundant or overly pivotal questions, or to evaluate if there are repeated data-gaps. We expect that the assessment will continuously evolve both from these internal evaluations and from external input, hence the long-term objective of having an interactive web-based version rather than just the printable format currently available.

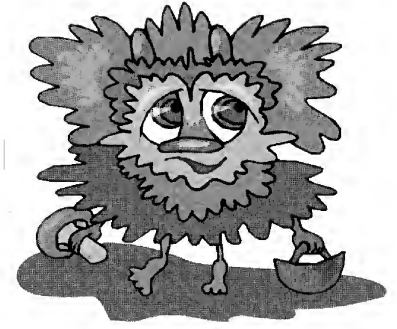
There is no doubt that for many species on the FLEPPC Category I list, we will be appearing to reinvent the wheel and our assessment will reach similar conclusions. For other species there will seem to be a reduced level of concern based on our stringent criteria and requirements for documented evidence. Alarming as this may seem to managers of natural areas, we anticipate that this could provide the impetus to gather more evidence, especially for species with expanding ranges, so that problem species are quickly reassessed and recognized. The precautionary approach of the FLEPPC lists is vital for the managers of natural areas and should be continued. The IFAS assessment is intended to complement this system and it is hoped that the many members of FLEPPC will contribute information on their least-favorite plant(s).

Alison Fox was Chair of the IFAS subcommittee that developed this assessment. She may be contacted at the University of Florida at (352) 392-1811 ext- 207 or amfox@gnv.ifas.ufl.edu

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Invasive Species and the Conservation Community



by Bob Devine

What Environmentalists Haven't Done

Let's begin by thinking about lather leaf (*Colubrina asiatica*) in Everglades National Park. An invasive, vine-like shrub from tropical Asia, lather leaf is spreading rapidly through the park's coastal hammocks. This climbing invader shrouds and kills native trees, eliminates understory species, and hampers subsequent canopy recruitment.

Lather leaf constitutes a significant threat to an area of exceptional biological value. Yet, due to budget constraints, little has been done to combat lather leaf, though very recently a fair amount of money was procured for that purpose. (We should note that the National Park Service, as well as assorted other federal, state, and local agencies, has committed considerable resources to battling invasives around the nation. Unfortunately, considerable isn't enough.) A lack of funding likewise prevented park managers from eradicating lather leaf when it first appeared, when a paltry \$20,000 or so would have done the job.

One would expect the conservation community to be in a lather over lather leaf. The health of the park is prominent on the agendas of numerous environmental groups, who are striving to improve its water pollution and water supply problems. Imagine the protests from conservationists if a corporation attempted to drill oil wells along the park's coast, yet lather leaf and its ilk pose a greater long-term danger than would oil wells.

The conservation community has given some attention to melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina* spp.), and Brazilian

pepper (*Schinus terebinthifolius*), the high-profile Everglades exotics, but even in these cases the amount of attention falls short of what the situation warrants. The modest engagement by the conservation community regarding invaders of natural areas is not confined to Everglades National Park. Only a few environmentalists have expressed concern about efforts to bring raw logs from Siberia into the western United States, which might introduce the voracious Asian gypsy moth (*Lymantria dispar*) and other in-

The public's lack of familiarity regarding exotics puts conservation organizations in something of a Catch-22

vasive insects and pathogens that could devastate vast expanses of western forests.

Few conservation groups have pressed for the control of Chinese tallow (*Sapium sebiferum*), though this insidiously pretty tree is overrunning coastal prairies throughout the South, including habitat vital to endangered species icons, such as the Whooping Crane (*Grus americana*). Nor have many environmentalists called for the control of the balsam wooly adelgid (*Adelges piceae*), salt cedar (*Tamarix* spp.), the green crab (*Carcinus maenas*), and the many other invasive exotic species plague natural areas all over the United States.

What Environmentalists Have Done

Though the conservation community has not given invasive species the attention they merit, it has spent some time and resources on the issue. A number of small local and state organizations have devoted much of their modest capacities to the matter. For example, various native plant societies convey information regarding invasives to their members and to the press, encourage government and business to address the problem, and organize local removal and restoration efforts. People in several states formed exotic pest plant councils (EPPCs), which typically consist of individual scientists, land managers, and conservationists who are concerned about invasive plants. These EPPCs provide a clearinghouse for information regarding invasives and bring the issue to the attention of their organizations, policy makers, and the media.

At the national level, a number of conservation organizations at least have the invasion on their radar screens. The most involved is the Nature Conservancy (TNC), one of the nation's largest conservation groups. TNC is unusual among such organizations in that it owns and manages large amounts of land; there are about 1,300 TNC preserves in the U.S. alone. TNC's interest in exotics has focused mainly on combating invasives in its preserves; given that many TNC lands have been invaded, the group had little choice but to deal with invasives.

The National Audubon Society owns and manages some preserves and, like TNC, has been battling invasives on its properties, but the other major national conservation groups don't own land and haven't been similarly compelled to confront

invasive species. However, some of these large, land-less organizations, such as Defenders of Wildlife, blend a consideration of invasive species into their other programs. For instance, in their biodiversity strategy for Oregon, Defenders highlights problems with invasive species in each ecoregion. Many other examples exist. Conservationists have referred to invasives in lawsuits seeking endangered species status for sage grouse and in concerns about global trade. They've testified at Congressional hearings on biological control. Environmentalists have published booklets, magazine articles, and technical manuals regarding invasives. Nonetheless, given the magnitude of the alien invasion, the efforts of the conservation community have been insufficient and scattered.

Reasons Environmentalists Haven't Done More

One reason can be appreciated by anyone working in wildlife management; conservationists lack the resources to painlessly mount anti-invasive species campaigns. Most major

environmental organizations have officers and staffers who would like to devote more time to invasive exotics, but these individuals already are working on water pollution, forests, wetlands, global climate change, and myriad other vital issues. They're reluctant to neglect any of their current responsibilities and they're reluctant to

Our mission is to energize and focus the anti-invasion efforts of the conservation community in order to protect our nation's wild lands.

pile more hours onto their already overloaded work weeks in order to tackle invasives.

The public's lack of familiarity re-

garding exotics puts conservation organizations in something of a Catch-22; their members know little about invasives and therefore it's hard for the organizations to make exotics a high priority, but until those organizations make exotics a high priority, their members aren't likely to know or care much about invasives. Even when conservation organizations elect to take the initiative in educating their members, which many have begun doing, the nature of the invasive species problem complicates the learning process. It is easy to communicate the harm caused by a clearcut or an oil spill. A single dramatic photograph can stir concern, even action. People don't have quite the same response to a photo of a wetland lush with the lovely blossoms of purple loosestrife (*Lythrum salicaria*).

It's harder still to convince people that the health of the land dictates the control of mountain goats (*Oreamnos americanus*) in Olympic National Park or wild horses (*Equus caballus*) in the Great Basin. Even when the animals can be removed without killing them,

many members of conservation groups and the public voice concern. When the elimination of invasive animals does involve killing them, that concern sometimes erupts into fierce protest. Some conservation organizations have experienced nasty confrontations with animal rights groups, and the fear of stirring up vocal animal advocates sometimes inhibits the anti-invasives efforts of the conservation community. And it's more than a public relations problem. Many conservationists have legitimate concerns that invasive animals may endure unnecessary pain and death in the course of control programs. Taking such concerns into account can complicate matters, even when people acknowledge the greater good of keeping the ecosystem healthy.

As with the control of alien animals, the use of chemical pesticides to fight invasives creates dissention within the ranks of environmentalists. Reducing pesticide pollution has long been one of the defining tenets of the environmental movement and it's a tough sell to make an exception in the case of invasive species. And most environmentalists feel that it should be a tough sell, that the use of pesticides on invasive organisms should receive close scrutiny. Many conservationists may resign themselves to occasional pesticide use as a lesser evil than an unchecked invasion, but they worry that pesticides may be applied too freely and not only as a last resort. They also worry that some land managers might use chemicals as a crutch, postponing the need to make basic changes in the way some lands are used.

Animal control and pesticide use are two examples of a fundamental dilemma that the conservation community must work through as it comes to grips with the alien invasion. Many environmentalists distrust active management. They've seen excessive logging done in the name of forest health and the control of native predators in order to protect livestock. Specifically in the realm of invasive species, environmentalists often have seen active management go awry. They remem-

ber such fiascos as the importation of opossum shrimp (*Mysis relicta*) into the Flathead River-Lake system in Glacier National Park to boost game fish populations, which started an ecological ripple effect that decimated the whole community.

Our overarching goal is to make sure that the conservation community does indeed recognize invasive species as a major problem, and that they do so soon, rather than after we have a world of weeds.

Yet many invasive species can't be controlled without some active management. The conservation

community's default position of "leave it alone" works well when trying to protect wild lands from logging, mining, grazing, urban sprawl, oil exploration, ski development, and the like. But a hands-off approach often is not sufficient to repel invasive species. For one thing, non-native species already have invaded a great many natural areas and invasives seldom go away on their own. But even many pristine wildernesses eventually will be invaded to some degree unless managers actively prevent invasion and carry out early detection and eradication programs. The conservation community sooner or later (and I hope sooner) will need to determine the appropriate role for active management of invasive species.

What Environmentalists Will Do in the Future

I don't know. But I do have some ideas and some hopes. I am the executive director of the Environmental Working Group on Invasive Species (EWGIS), a new entity formed in No-

ember, 1999. So far we have members from American Lands Alliance, the Center for Marine Conservation, Defenders of Wildlife, Environmental Defense, National Audubon, the Nature Conservancy, Sierra Club, the Wilderness Society, and the World Wildlife Fund. In addition, we're forming a wide network of scientists, land managers, industry representatives, private land owners, government officials, and conservationists whose groups aren't represented on EWGIS.

Our mission is to energize and focus the anti-invasion efforts of the conservation community in order to protect our nation's wild lands. We hope to perform some functions that have been largely neglected within the conservation community. For example, EWGIS will be a forum for multi-organization discussions on invasives and a clearinghouse for conservation-oriented information regarding non-native invaders.

Perhaps most important, EWGIS can be the unifying force that brings environmental groups together to pursue anti-invasives initiatives. An informed and determined environmental community can help fundamentally

shape invasive species policy.

We also hope to help conservation organizations address invasive exotics in the context of their other programs. Many of our efforts to solve environmental problems falter because we look at things in isolation, not as dynamic ecosystems. We need to make sure that when people gather around a table to discuss a forest plan or a river corridor restoration or an endangered species study, they also consider invasives.

So much for sweeping, even grandiose, intentions. Though EWGIS is so new that we don't yet have all our detailed goals nailed down, we can get specific about a few of the things we may urge an energized conservation community to accomplish. For example, we'd like to convey the conservation community's views to the framers of the National Invasive Species Management Plan, a document mandated by President Clinton's 1999 executive order on invasive species. We'd like to strengthen existing legislation regarding invasive species, such as the Federal Noxious Weed Act, and make it more attuned to the needs of natural areas. We'll urge government,

business, and non-profits to substantially increase their spending on invasives. We'll press for improved screening for invasives at U.S. borders, particularly invaders of natural areas, which currently get little attention from the agriculture-oriented screeners.

We have other specific goals, and no doubt many more will crop up as the invasion rises to take its rightful place alongside habitat loss, pollution, global warming, and the other urgent environmental issues of the day. Our overarching goal is to make sure that the conservation community does indeed recognize invasive species as a major problem, and that they do so soon, rather than after we have a world of weeds.

Bob Devine is the Executive Director of the Environmental Working Group on Invasive Species and the author of the book "Alien Invasion," published by National Geographic in 1998. He can be contacted at (541) 752-2212, or devine@proaxis.com.

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In 1998, Chattanooga, TN hosted the Fifth Annual Tennessee Exotic Pest Plant Council (TN-EPPC) Symposium. This gathering was a significant step in establishing the Southeast EPPC, but even more importantly, the symposium peaked the interest of many con-

Partnerships take Pride

by Steve Manning and Lee Patrick

cerned individuals who wanted to make a difference to their city's landscape. The Tennessee Aquarium, Tennessee Wildlife Center (formerly the Chattanooga Nature Center), Reflection Riding, Lookout Mountain Land Trust, the Urban Forestry Section of the Department of Parks, Recreation, and Arts and Cultures, and others have played a significant role in the resurgence of Chattanooga and the city is now being deemed by some as the "Sustainable City."

Due to the actions of these groups, the Riverview community, located in northwest Chattanooga, has recently gained a face-lift. No, there is no new shopping mall, no there is not a new resort hotel, nor is there any major road construction. What Riverview residences are talking about these days is the reconstruction of the Riverview Bird Sanctuary. What, you mean all the

fuss is about some 6.5 acre wooded lot bordering the Tennessee River that was once forgotten and was used as a hide-away for some mischievous teens and the like?

In the 1940s the community of Riverview poured many of their resources into creating the Riverview Bird Sanctuary. They envisioned a quiet place for the citizens to enjoy their natural surroundings while providing ample food and shelter for avian populations. With that in mind they began planting Amur bush honeysuckle (*Lonicera maackii*), multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*), common privet (*Ligustrum vulgare*), English ivy (*Hedera helix*), winter creeper (*Euonymus fortunei*), and both *Vinca minor* and *V. major*. And sometime during that time kudzu (*Pueraria montana*), mimosa (*Albizia julibrissin*), and tree-of-heaven

(*Ailanthus altissima*) made it on the scene. By the 1960s the site was beginning to be overlooked and began falling into disrepair

The invasive plant species were left to take over the sanctuary. In some locations within the sanctuary, privet stems formed a continuous ground cover with approximately 114 stems per square meter. In other areas, the forest floor was a one-foot deep mat of English ivy, *Vinca* sp., and *Euonymus fortunei*. Ninety percent of the tree trunks were covered with English ivy and portions of the tree canopy were over-topped by kudzu. Not a pretty picture.

Today, the Department of Parks, Recreation, and Arts and Cultures is trying to recapture the natural state of this property by providing the community with benefits of a native landscape. The Urban Forestry Section, Riverview Garden Club, Girls Preparatory School of Chattanooga (GPS), the citizens of Riverview, and Invasive Plant Control, Inc. (IPC) have partnered to combine resources for the rehabilitation of this site by controlling

the invasive plants and restoring it with native plant species. Once the plans were in place the face-lift began.

The first course of action was to control the woody invasive species. In November 1999, IPC began the task of cutting and treating each stem by using chainsaws and brush cutters and applying Garlon 3A (triclopyr amine) at 25% concentration. In order to treat the ground cover, the debris had to be removed from the site. The Urban Forestry Section provided workers to pull the debris to the roadside in order for the grapple trucks to take the biomass to the composting site. (For the record, none of the plants had fruit.)

Once the debris was cleared, IPC began the treatment of the ground cover species. This involved cutting the ascending vines from the individual trees using lopping shears and in some instances chainsaws, and then treating the cut surfaces with Garlon 4 at a concentration of 25%. Afterwards,



the entire site had to be foliar sprayed to control the English ivy, *Vinca's*, and winter creeper. The application was performed in February in order to avoid contact with non-target species. The applications consisted of Garlon 4 at 2% and horticultural oil for the areas where drainage was not evident, while Accord was used at 2% with a non-ionic surfactant near drainage sites. IPC returned to the site in May to spot-treat some of the ground cover with 2% Garlon 3A and surfactant, and also to treat the kudzu climbing the trees. IPC has found excellent control of kudzu by using 0.50% Transline and



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surfactant. IPC will return to the site in the Fall 2000 to aid in the maintenance of the site.

In the meantime, the Riverview Garden Club has sponsored workshops on the control of invasive plants and native landscaping. The residence of Riverview and Chattanooga are encouraged with the outcome of the Bird Sanctuary project (and notably more birds and more appealing) and are now becoming involved in their own invasive plant control and native landscaping. The students and teacher at GPS are using native landscaping brochures as a guide, put out by TN-EPPC, to begin introducing East Tennessee native plants back into the sanctuary. All this in order to say that Chattanooga takes pride in its partnerships.

Lookout, Lookout Mountain, TN. The partners there, the Lookout Mountain Land Trust, the City of Lookout Mountain, the residences of Lookout Mountain, the National Park Service, Reflection Riding, the Tennessee Wildlife Center, and Invasive Plant Control, Inc. are pulling together to initiate more on the ground projects. Did I hear someone on the Mountain echo "exotic free by 2003?"

Steve Manning and Lee Patrick may be contacted at Invasive Plant Control, Inc. P.O. Box 40987 Nashville, TN 37204, 800-449-6339 steve@invasiveplantcontrol.com and lee@invasiveplantcontrol.com, respectively.

Call for Papers and Participation

**Southeast Exotic Pest Plant Council 2001
Conference: A Weed Odyssey
Wednesday, March 21 - Friday March 23, 2001
Georgia Center for Continuing Education
University of Georgia • Athens, Georgia USA**

Conference Objectives

The objectives of this interdisciplinary conference include: 1) exchange information and technology leading to cost-efficient management of invasive exotic species in natural areas; 2) provide a forum for participants to develop networks of mutual assistance; and, 3) facilitate interdisciplinary dialog between policy makers, land managers and researchers.

Call for Papers

Participants are invited to submit proposals for oral presentations at the Conference. Accepted abstracts will be published in Conference proceedings and should be written in English. Specific topics to be covered will include, but are not limited to, the areas below:

- Applied and basic ecological research
- Control and management - herbicide technology/Integrated Pest Management
- International initiatives
- Outreach and extension
- Public policy
- Regional and federal action plans
- Screening and assessment techniques

Keynote Speaker

To be announced

Instructions for Authors

The abstract should be a maximum of 400 words and provide sufficient information for readers to fully analyze the objectives, methods, results and implications of the work in question. Each submission must be original work that has not been previously published. Each abstract will be reviewed by the conference committee and recommended for either acceptance or rejection.

Submissions should be sent in the following formats:

- E-mail (preferred) to **cheryl@uga.edu** or
- Plain Text
- PostScript (.ps)
- Portable Document File (.pdf)
- Hard Copy
- Five Copies
- Mail to: **Cheryl M. McCormick**
Institute of Ecology, UGA
Athens, Georgia 30602-2022

General Instructions

Headings. The title, names(s) of the author(s), their affiliation(s), city and country should be included. Please do not include university degrees, titles, street address, and zip code. References. Please try to minimize the amount of reference.

Important Dates

- September 1, 2000: Abstract submission deadline
- October 1, 2000: Notification of acceptance
- December 15, 2000: Early registration due

Conference Committee

Joyce Bender (KY), Brian Bowen (TN), Ray Dorsey (GA), Amy Ferriter (FL), Stratford Kay, William Kline (GA), (NC), Cheryl McCormick (GA), Tony Pernas (FL), Johnny Randall (NC), Dan Thayer (FL).

Internodes

XenoNET

Fearing the loss of the great Australian bush? Harried by heaps of hungry hoppers in Kakadu Biosphere Reserve? Trying to guess which organism will next enter your domain and wreak ecological havoc with your equilibrium? Well, there are lots of others out there with similar fears.

Australians are seriously striving to prevent importations of new species that imperil both the maintenance of biological diversity and productive land use. You can see for yourself at a wide-range of Aussie websites, including: <http://www.csiro.au/page.asp?type=sector&ide=Biodiversity>

Australians are looking "under Down Under" for marine pests of the Great Barrier Reef and other marine systems; trying to stop rampant rabbit rampages and mounting massive mousehunts to stem the tide of formerly-introduced invasive organisms. Whether these earlier introductions were intentional, or merely accidentally ignorant events, folks with the Commonwealth Science and Industrial Research Organization (CSIRO) aim to prevent problematic non-native life forms from reaching their shores without an invitation.

Of course, similar initiatives are under way elsewhere around the globe. The Wyoming Weed and Pest Council website ([http://asuwlink.](http://asuwlink.uwyo.edu/~caps/sites/links.htm)

<http://asuwlink.uwyo.edu/~caps/sites/links.htm>) offers many links that summarize and help identify problematic exotic species and provide mapping information to help determine whether your problems truly present "growing" concerns.

The USDA Animal Plant Health Inspection Service (APHIS) website (<http://www.aphis.usda.gov/ppq/>) can help you stamp out your plum pox and determine whether you've Africanized killer bees. Reports on this site outline policy regarding invasive species prevention programs, provide lists of species of concern, and describe efforts underway for many pests already established in the U.S.

Yet, the usual roadblock, lack of serious funding, prevents the U.S. from having a program that can realistically thwart importations of ill-advised species. At present, we can only hope that all seriously problematic species will be found during the inspections made upon only about two percent of the billions of importations made annually.

And what about organisms we don't even know we have yet? Like those being devised in genetic engineering laboratories by gene-designers hoping for lucrative IPOs and instant billionaire status? Fears of genetically modified crops have been voiced strongly in European countries. Reports giving full attention to these is-

ssues are available at the UK Dept of Environment, Transport and the Regions (DETR) website: (<http://www.environment.detr.gov.uk/acre/wildlife/01.htm>). Here, discussion papers recommend that modern plant breeding techniques bear increased levels of concern. Plant breeding has developed from simple selection and guidance of desirable traits within one specie's gene pool to cutting and splicing gene fragments between different organisms. Yet, controls are clearly explained and that a completely inclusive program requires formal evaluation of all proposed introductions of genetically-modified materials.

We'll never know whether such insight and constraint could have prevented early introductions of purple loosestrife into North America marshes or American prickly pear cactus into the Aussie Outback. But it seems like more limits, more thought and more evaluation are the only ways to slow the homogenization of the world's regional ecological uniqueness.

MARK YOUR CALENDAR

International Conference for the Society of Ecological Restoration. Liverpool, England. **September 4-9, 2000.** Contact: SER 608/265-8557, ser@macc.wisc.edu, www.ser.org

27th Annual Natural Areas Conference. Henry VIII Hotel, St. Louis, MO. **October 16-20, 2000.** Contact: Kate Leary, 573/751-4115 x3183, learyk@mail.conservation.state.mo.us.

Herbicide Action. Purdue University, West Lafayette, IN. **October 15-20, 2000.** Contact: S.C. Weller, 765/463-6007, wellerhort.purdue.edu, www.hort.purdue.edu/misc/herbicideaction/.

54th Annual Southern Weed Science Society Conference, Beau Rivage, Biloxi, MS. **January 22-24, 2001.** Contact: www.weedscience.msstate.edu/swss/.

Weed Science Society of America. **February 11-15, 2001.** Greensboro, NC. Contact: Charlotte Eberlein, 208/763-3600, ceberl@uidaho.edu.

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